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SUMMARY REPORT

THE DIFFUSION OF [illegible]RAL GAS IN THE QUEBEC RESIDENTIAL SECTOR

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The analysis and conclusions of
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SUMMARY

The present study analyzes the *status quo* of the introduction of natural gas as an energy source for the single-family residential sector in Quebec. It focuses on how this new source of energy for Quebec is perceived by owners or tenants of single-family residences currently using oil or recently converted to natural gas.

By its very nature, this study is exploratory and descriptive; it does not set out to prove a thesis. Rather, it offers a simple description of an actual situation, and is based on the study of behaviour patterns, perceptions, opinions, attitudes and intentions of individuals selected at random in the residential areas of Montreal, Quebec City, Sherbrooke and Trois-Rivières, where natural gas is being introduced as an alternative source of residential energy.

Finally, this study meets the research team's specific and limited mandate to answer certain specific questions on the introduction of natural gas in Quebec. It is not addressed to specialists in the field, but to managers who make the decisions promoting the diffusion of natural gas in Quebec, or anyone else seeking information on the current state, as well as the future, of natural gas in Quebec.

INTRODUCTION

Several years ago, natural gas was introduced to western Canada and Ontario with considerable success. The difficult energy situation in the last half of the seventies and the rise in the price of petroleum, together with the threat of an interruption in supplies, prompted people not only to conserve and economize, but also to convert their equipment to other energy sources which in the long run would be cheaper than oil, with the added advantage of a guaranteed supply in the future. At the same time, the federal government formulated a package of programs designed to encourage people both to insulate their homes and to replace fuel oil by other energy sources.

The arrival of natural gas in Quebec from the West via the Trans-Canada Pipeline coincided with a number of changes in both the world and the national energy scenarios. Petroleum market conditions have turned around: the decrease in demand caused by the world recession has created an oil glut, with the resulting imbalance leading to a drop in international petroleum prices. As a result, the spectre of shortages is disappearing. Thus, no sooner has natural gas come to Quebec than it appears to have lost much of its relative advantage -- low price and better guarantee of stable supply. The initial results of efforts to market natural gas appear to have fallen short of industry forecasts.

Marketing and diffusion of natural gas depend, as in the case of other energy sources, on changing economic and environmental conditions which should be examined from a developmental point of view.

Generally speaking, little empirical work has been carried out to date towards a better understanding of the natural gas marketing and diffusion phenomena and the variables influencing individual energy source choices.

Furthermore, the selection of gas as an energy source cannot follow a natural and spontaneous course of diffusion like other products since it depends on the progress of the main pipeline bringing the gas to the various residential target zones.

Finally, the diffusion of natural gas in Quebec takes place in a specific competitive context: the province is divided into two territories, with a different company holding a franchise giving it a monopoly on natural gas distribution within each territory. In addition, there is keen competition from other energy sources, in particular electricity and fuel oil, both of which have problems of overproduction, at least temporarily.

DEFINITION OF THE PROBLEMS

In brief, the problems associated with the diffusion of natural gas as an energy source for the residential sector can be divided into two elements: the traditional problem of marketing and diffusing an innovation, and the particular nature of natural gas in this context.

The traditional problem of marketing and diffusing an innovation involves the following elements:

- awareness and understanding of the innovation, in this case natural gas;

- individual assessment of natural gas as a residential energy source;

- willingness to adopt natural gas as a new residential energy source;

- nature of factors which accelerate or slow down the adoption of natural gas as a residential energy source; and

- characteristics differentiating consumers interested in adopting natural gas as an energy source and those not interested.

Diffusion of natural gas in Quebec also has a certain number of special characteristics with respect to other products and circumstances, and these must be taken into account in order to properly understand what is happening or what could happen in this field in Quebec.

The particular elements of natural gas marketing and diffusion have to do with:

- the special competitive climate in the Quebec residential energy field. There are three principal sources of energy in the province, namely heating oil, electricity and natural gas, and one auxiliary source, wood. To these must be added a new combination proposed by Hydro-Québec, the dual-energy system combining an electric system and an oil system. Electricity is supplied by the public utility monopoly of Hydro-Québec. Natural gas is supplied by two companies, Gas Métropolitain and Gas Inter-Cité, each with an exclusive territory. Fuel oil is supplied by many private companies and one Crown corporation, Petro-Canada.

- the energy field is highly regulated.

- the energy field is subject to government policies.

- natural gas, like electricity, is primarily a service, rather than a product.

- it is impossible to try out the service prior to adopting it.

- for many, natural gas does not represent a new product, but one with the negative connotation of an idea whose time has gone.

- in the case of natural gas, diffusion also depends on the speed with which the gas pipeline network progresses.

The specific questions raised by the study, then, are as follows:

- What are the factors which accelerate and slow down the selection of natural gas as an energy source?

- What is the decision-making process used by individuals to select an energy source?

- What information sources are used?

- What are the characteristic differences between those who adopt natural gas and those who do not?

- How do consumers perceive energy conversion assistance?

- Are there any means to forecast adoption of natural gas?

- What measures might help to accelerate adoption of natural gas as an energy source?

The present study attempts to achieve an empirical and intuitive solution of this problem by carrying out an objective and simple analysis of the existing situation, by attempting to forecast its possible development, and lastly, by trying to answer the questions raised in a pragmatic manner.

LITERATURE REVIEW

In view of the objectives of this study, it was possible to borrow from the conceptual framework and study methods of several lines of research. Nevertheless, the review of the literature was focused on a central point of interest: the adoption of natural gas as an energy source by occupants of single-family dwellings (including semi-detached and row housing).

In essence, this literature review aims to establish a point of departure for the present study, to avoid the duplication of results which might already be available, and to profit from the experience of other researchers and their conceptual efforts.

A MULTITUDE OF CONSIDERATIONS

The research on which this study can draw involves numerous considerations, and therefore the literature reeview has been focused on the evaluation of studies and research on: the marketing and diffusion of natural gas; the marketing and diffusion of various forms of energy; and the diffusion of innovations and the adoption process.

These various fields have been studied not in a general and academic fashion, but with the specific aim of using them as a reference base. Some studies may have been ignored because they do not fit into the selected conceptual framework, or because they do not offer any additional elements which are capable of improving the approach to the problem.

THE MARKETING AND DIFFUSION OF NATURAL GAS

There is little in the literature on natural gas which is relevant to the present research. *AGA Monthly*, the magazine of the natural gas industry in the United States, does, of course, publish articles on the marketing of natural gas. Another line of research deals with economic analyses related to various energy sources, and the economic impact of existing and unforeseen variations in the availability of energy sources on one hand and variations in the prices of these sources on the other. Numerous studies also deal with forecasts of natural gas reserves around the world and in North America, and with the impact of regulatory policies. Our study is not concerned with such macro-economic concerns, however, but rather with micro-models of decisionmaking in the home and with their combination into a general diffusion model.

Other studies are more relevant to ours, and deal with the following:

- methods of gas marketing (Cuccinelli Jan., Feb. and March 1980; AGA Sept. 1980; AGA Dec. 1980; Clark 1979; Harrison 1979);
- marketing opportunities in the natural gas field (Ingram 1980; Menzer 1980);
- the advantages of converting to natural gas (AGA Sept. 1980);
- the effects of regulation on the marketing opportunities in this field (Kotler 1979);
- the characteristics and behaviour patterns of consumers with respect to natural gas (AGA Nov. 1980);
- natural gas demand forecasts (AGA May 1980);
- the structure of the natural gas industry and markets (AGA Sept. 1980; AGA April and Dec. 1979);
- advertising campaigns for gas (Ingram 1979; AGA July and Oct. 1979);
- the liquified natural gas market (AGA, April 1979).

Only one academic study has dealt specifically with the adoption of natural gas (Verhallen and Van Raaij 1981). Its authors examined the factors which determine the choice of a form of residential energy, and established that household behaviour patterns and house characteristics are the main determinants of this choice, while attitudes are of little practical importance. The fact that it was done in the Netherlands reduces its value in this case.

MARKETING AND DIFFUSION OF VARIOUS ENERGY SOURCES

Insofar as energy is concerned, however, numerous studies have been carried out over the last five years and the number of publications is constantly growing. For the special needs of the present research, we have taken into account only studies in which the conceptual framework, approach, research methodology and results might serve as a basis for our own work.

Several bibliographies (Anderson and McDougall 1980; Anderson and McDougall 1982), together with a special issue of the *Journal of Consumer Research* (JCR, 8, vol. 3, 1980) and a collection of papers (Claxton et al. 1981), illustrate the increasing level of interest which has recently developed in this field. Finally, two articles provide a rela-

tively good review of some research aspects in the energy field (McDougall et al. 1981; McDougall et al. 1979).

This review allows the identification of the following research categories:

- consumer behaviour in energy consumption;
- the impact of energy conservation programs;
- the process by which energy-related innovations or new forms of energy are adopted.

The studies aimed at understanding behaviour patterns in energy consumption may be subdivided into studies on the way people perceive the energy crisis and studies measuring energy consumption behaviour patterns and underlying attitudes.

Most of the studies on perception of the energy crisis were inspired by the acute energy crisis conditions (difficulty of supply and increase in prices) and undoubtedly reflect opinions of a relatively current nature, consisting of either rejection or exaggeration (Fahrar et al. 1979; Milstein 1977). The general deterioration of economic and social conditions, the related trend to lower petroleum prices and the existence of a surplus of reserves for most energy sources have undoubtedly modified these opinions; as a result, many of the behavioural factors motivating conservation or change in energy sources have lost strength.

The studies dealing with energy consumption behaviour patterns have been mainly oriented towards the use of energy conservation methods (Ritchie, McDougall and Claxton 1981). In addition, a prodigious research effort has been devoted to models explaining energy consumption (McDougall et al. 1981; Verhallen and Van Raaij 1981; Seligman et al. 1979; Fritzsche 1981; Good 1979; Bowman and Fishbein 1978). These studies have dealt mainly with the study of energy consumption levels rather than the types of consumption or the choices made among general available energy sources.

In the energy conservation program assessment field, the research has been oriented towards the impact of four principal types of programs or initiatives: information programs, incentive programs, disincentive programs and restrictions.

With respect to information, studies have tended to reveal that communications have had a relatively weak impact on energy savings (Craig and McCain 1978; Geller 1981; McDougall and Ritchie 1979; Quelch 1979; Anderson and Lipsey 1978). Nor is the impact of the information feedback process on energy consumption particularly evident in the numerous studies on the subject (Becker 1978; Becker et al. 1979; Seligman et al. 1979; Hutton and McNeill 1981).

As for conservation incentive programs, the research has concentrated mainly on the rebates related to changes in consumption and to incentives for use of public transport and car pools (Winett et al. Pitts and Wittenbach 1981; Hutton and McNeill, 1981). In general, the results are not very clear, and the same is true for research on strategies to discourage certain consumption and behaviour patterns, by increasing prices, for example (Pitts and Wittenbach 1981; Caves and Christenson 1980).

Very little research has tackled the direct restrictive measures, which, in the Canadian or North American context, are in any case neither well received by the population nor used by the authorities on any regular basis.

Bennet and Moore (1981) measured consumer preferences with respect to energy conservation methods, and their results clearly show that consumers prefer incentive programs to coercive policies. Belk et al. (1981) attempted to relate preferred solutions to the crisis and the causal factors cited by individuals.

On the process of the adoption of energy innovations, or of new forms of energy, a few studies have been carried out, mainly on the adoption of solar energy (Leonard-Barton 1981; Labay and Kinnear 1981; Cesta and Decker 1978; Shama 1981; Wisenblit 1981; Shoemaker 1981; Roessner 1981), and it is paradoxical that until very recently this field represented a very small proportion of energy consumption research.

The diffusion of solar energy technology has occurred only very recently (Leonard-Barton 1980), and it appears that this is a field which should develop very rapidly. In fact, a parallel can be found with "natural gas" energy. Sparrow (1977) has examined the socio-economic factors influencing the adoption of solar energy. Cesta and Decker (1978) have made an attempt to identify the factors which inhibit its diffusion. There is a fairly major difference from natural gas, however: solar energy is not dependent on a distribution network, and there are no dangerous potential side effects.

In summary, research in the energy field has mainly been oriented towards:

- forms of energy: nuclear energy, solar energy, electricity, gasoline, fuel oil, natural gas, coal, wood, etc.

- activity sectors: residential, commercial, industrial, transportation (heating, air conditioning, hot water, household appliances).

- attitudes and behaviour patterns: the energy crisis; the role of the individual consumer with respect to energy conservation; the role of the government; the role of public utilities; new technology; the environment and quality of life; and energy consumption.

- consumer decisionmaking: pre-selection, the selection itself, and post-selection.

- impact of energy policies and information, and the effect of incentive or disincentive programs on various forms of energy consumption or on behaviour patterns with regard to energy.

THE ADOPTION AND DIFFUSION OF INNOVATIONS

The diffusion of innovations is a field of research especially pertinent to the present study, particularly with regard to the adoption process, the diffusion curve and opinion leadership.

The concepts underlying the adoption and diffusion of innovations have been given special attention in recent years (Brown, 1981; Rogers and Shoemaker 1971; Robertson 1971). Furthermore, the adoption and diffusion processes can be integrated into a broader process: social hhange (Kotler and Zaltman 1971).

The principal components to be considered in the paradigm are: the innovation per se; the individual who decides to adopt the innovation; and diffusion of the innovation throughout the social system.

The concept of "innovativeness" includes several elements, and is usually defined as the extent to which one individual is quicker to adopt an innovation than another is (Rogers and Shoemaker 1971). On the other hand, much research attention has been given to the intrinsic attributes of innovations and to the measurement of the way these attributes are perceived by the adopters (Ostlund 1974; Rogers and Shoemaker 1971).

The attributes most often taken into account are:

- the relative advantage of the innovation;

- the perceived risk of adopting it;

- difficulty in understanding or using the innovation;

- compatibility of the innovation with other equipment, behaviour patterns or even attitude;

. the possibility of trying the innovation out before the final adoption; and

. exterior visibility to others of adopting the innovation.

The process of adoption

Rogers (1962) has identified five phases in the process of adoption by individuals: awareness; interest; assessment; trial; and adoption.

These phases are rearranged into another framework by Rogers and Shoemaker (1971): awareness; persuasion; decision; and confirmation.

The diffusion process

Rogers and Shoemaker (1971) suggest a definition for the diffusion process consisting of four elements:

- It is an innovation

- which is communicated via certain channels

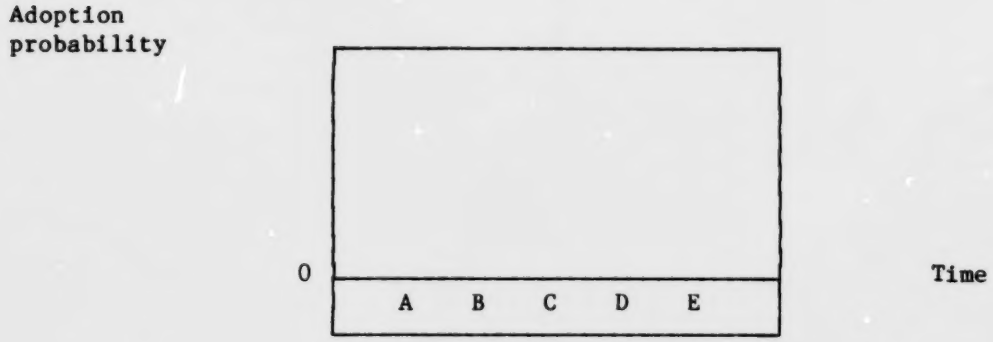
- over a period of time

- among the members of a social system.

Innovativeness is defined as the relative speed or slowness with which an individual adopts an innovation in comparison to other persons (Midgley and Dowling 1978). One of the basic assumptions is that people vary greatly in their willingness to try new products (individual differences) (Mittelstaedt et al. 1976).

The *innovation diffusion curve* refers to the existence of a variety of categories of consumers in relation to innovation adoption time. In fact, it appears that individuals adopt innovations at different rates; there are several categories or receptiveness with respect to the adoption of a new product, and these are explained by individual differences.

This curve therefore brings out the "type" of consumer who becomes involved at various points in the process of adopting the innovation. It has the following profile:



The categories of consumers shown in the above diagram are as follows:

(A) innovators: 2.5%
(B) early adopters: 13.5%
(C) early majority: 34%
(D) late majority: 34%
(E) late adopters: 16%

The characteristics of the adopter categories have been the subject of many studies attempting to define the socioeconomic, psychological and demographic characteristics of innovators and late adopters (Uhl, Roman and Lance 1970; Taylor 1977).

The adoption rate and influence of product characteristics on the adoption rate

Certain product characteristics influence the product adoption rate:

° The relative desirability of the innovation, or its apparent superiority over previous concepts. The greater the perceived relative desirability, whether it be in terms of safety, cost or availability, the more rapidly will the innovation be adopted.

° Innovation compatibility, that is to what extent the innovation corresponds to the values, expectations and experience of individuals in the social system concerned. Innovations compatible with favourably-perceived concepts are adopted more quickly.

° Innovation complexity, that is the relative degree of difficulty in understanding and using it. Complex innovations probably take longer to become diffused.

° Possibility of evaluating the innovation, that is to what degree it can be tried out on a limited basis. Trials appear to contribute towards inceasing the rate of product adoption. (Trials are not possible in the case of natural gas.)

° Innovation visibility and communicability, that is the relative possibility of observing results and describing them to others. Innovations which lend themselves to demonstration or advantages are subject to faster diffusion.

° Perceived risk, which may be defined in various ways: social, physical and financial.

According to Ostlund (1974), the perception of innovation attributes (relative desirability, compatibility, complexity, visibility, trial and perceived risk) is a good indicator of the purchase of a new product. The personal characteristics of the potential buyer (social integration, self-confidence, interest, household income, occupation and age -- sociological, psychological and demographic variables) are not useful as indicators. However, innovation perception by potential adopters can be a very effective predictor of innovativeness, more so in fact than the variables which characterize the individuals themselves.

Opinionmakers

Studies have generally found that the characteristics of opinionmakers correspond to those of early buyers; hence, we can speak of the "innovator-communicator" (Rogers and Shoemaker 1971; Baumgarten 1975).

Opinionmakers are characterized by the following traits:

. external communication: they are more cosmopolitan, more exposed to the mass media and have more contacts;

. accessibility: they participate socially to a greater extent;

. social status: their social status is higher than average; and

. they are more innovative.

FRAMEWORK, OBJECTIVES AND METHODOLOGY

FRAMEWORK

As a guide foi this research effort, a conceptual framework which would bring out the variables under study, together with their potential inter-relationships, was developed. This is not a complex and detailed structuring of all the concepts and all imaginable relationships, but rather a reference framework to understand, within the context of this exploratory study, the linkages among the various data collected and the manner in which they relate to each other.

The literature review allowed the development of a conceptual framework for this study based on innovation diffusion concepts and the notion of opinion leadership, together with that of the existence of a process at the individual level based upon perceptions and decision-making rules influenced by various communication sources (Figure 1).

Within the target regions for the natural gas expansion program, each individual receives information on the possibility of converting to natural gas. The individual evaluates the possibility and then decides to convert, the decision taking the form of an intention to convert as soon as natural gas is in fact available. This evaluation is based on the individual's perceptions of the characteristics of natural gas and its relative advantages and disadvantages in relation to other sources of energy.

The individual's decision may translate into a concrete act of adoption, but not always immediately. Once the decision is made and the conversion carried out, the individual undertakes an after-the-fact evaluation and then communicates this evaluation to a circle of acquaintances. If this communication is positive and supported by a favourable evaluation of his or her experience with gas, it is one of the most powerful means of collective persuasion in favour of change.

This general outline nevertheless depends on individual circumstances which range from disposable income through a working knowledge of subsidy programs to the family's age.

Thus interpersonal communication and access to information can play a very significant role toward an act of adoption. The information can come from a variety of sources, which may or may not be credible to the individual. One of the most influential is undoubtedly interpersonal word-of-mouth communication. Such communication, when it exists and is positive, is an asset to the innovation and is particularly favourable to its diffusion.

Certain facilitating or triggering elements can also play a special role; for natural gas, the availability of subsidies is a case in point.

OBJECTIVES

- To carry out a review of the literature on the diffusion of natural gas, comparable energy sources or other innovations.
- To determine the perceptions and assessments of owners or tenants of single-family homes presently heated with oil, on the various energy sources.
- To gain an understanding of the determining factors in the decisionmaking process of individuals as to the selection of a source of energy for the home.
- To measure the level of knowledge and understanding of natural gas.
- To measure the existing and potential penetration of natural gas as a source of energy for the home in Quebec.
- To evaluate word-of-mouth communication on the subject of natural gas, whether at the mass or personal level.
- To evaluate the degree of satisfaction of owners who have adopted natural gas, and the resulting word-of-mouth message.
- To evaluate the general knowledge of conversion subsidies and their importance in the decision to convert.
- To measure the phenomena of opinion leadership in the field of energy.
- To analyze the competitive position of natural gas in the Quebec residential sector.
- To formulate a set of recommendations on how to promote the diffusion of natural gas in Quebec.

RESEARCH METHODOLOGY

A strict research methodology was designed and applied to meet the objectives.

Geographical Areas Studied

First, the geographical areas studied are the territories that are targeted at present, or are to be targeted within the next two years, by the companies responsible for marketing natural gas in Quebec. Thus, these areas already have access to natural gas or will have it within the next two years. The areas were defined in cooperation with Gaz Métropolitain and Gaz Inter-Cité. The selected sectors are located in the metropolitan areas of four cities: Montreal, Quebec City, Trois-Rivières and Sherbrooke. A sampling process was carried out independently in each of the cities.

Sampling and Selection of Respondents

The study population within the selected areas consists of occupants of single-family dwellings (or duplex, triplex and row housing) who are currently using either heating oil or natural gas as the main energy source (for home heating in particular). Dwellings heated by electricity were excluded since they are not generally suitable for conversion to natural gas.

Selection of respondents in the pre-selected areas was carried out on the basis of the census. Following a preliminary selection, respondents living electrically-heated were eliminated from the sample.

For the survey as a whole, the rejection rate was about 5 percent. Following pre-analysis and coding of the questionnaires, some had to be eliminated either because of sampling error or because they were incomplete. This brought the usable sample to the following sizes in the various target areas:

Montreal	402
Quebec City	386
Sherbrooke	400
Trois-Rivières	321
Total	1 338

Respondents were selected under a male/female quota method using systematic random selection, to which self-selection was added on the basis of willingness to respond. The theoretical goal of the quota method used was to obtain an equal number of male and female respondents. However, in order to answer the questionnaire, the respondent was required to be the person or one of the people responsible for energy decisions in the home.

The interviewer was required to assess the participation of the respondent in energy decisions. If the first person selected did not seem to be the primary decisionmaker on energy matters, the spouse was asked to respond. In this way, the procedure could upset the planned male/female ratio in the sample because of the greater participation of one of the two sexes in decisionmaking on energy. The natural bias introduced in this way was accepted as an objective indication of the greater role of one sex or the other in energy decision-making. This procedure also ensured that the results would represent a more accurate view of the situation through the effect of this natural weighting. The presence of a greater number of men in the sample reveals the fact that men still dominate home energy decisions to some extent.

Data Collection Method

Data collection consisted of a door-to-door procedure which combined both personal interviews and self-administered questionnaires. The survey investigator would visit the home selected by the sampling method, and select the appropriate respondent. Data collection began with an interview aimed at obtaining, spontaneous responses on the way in which the various forms of energy available are perceived and assessed. Once this was done, the survey investigator gave the respondent the second part of the questionnaire, allowing a day for its completion, and returning to pick up the completed questionnaire. This procedure proved to be very effective; the refusal rate remained at about 5 per cent, giving this survey special value, as it was unnecessary to take into account possible differences between respondents and non-respondents which could cast doubt on the validity of the results.

RESULTS

This section presents the principal findings of the empirical study carried out in Montreal, Quebec City, Trois-Rivières and Sherbrooke. The overall framework, determined after a preliminary analysis of data, is to present the findings for the sample as a whole first, after which a city-by-city comparison of the results is carried out to highlight the differences. Although this approach was used for all analyses, only relevant or significant results are presented.

DESCRIPTION OF SAMPLES

The characteristics of the samples of respondents interviewed are presented in Table 1. These characteristics can be considered representative of the geographical target area markets for natural gas promoters.

ENERGY SOURCES

General findings regarding heating and electricity

Within the sector not heated by electricity, there is, in addition to heating oil, which remains the main energy source, the beginning of a diversification towards other forms of energy (Table 2): natural gas (7.2%), propane gas (0.3%), wood (1.7%) and the dual-energy system (8.4%) combining heating oil and electricity, recently spearheaded by Hydro-Québec. This pattern varies somewhat from one city to another. In Montreal, there is a relatively high proportion of natural gas (19.7%), due to the fact that this energy source has been available for several years now and has been the subject of a marketing effort. In Sherbrooke, on the other hand, the dual-energy system has clearly made progress (12.6%).

There is a fairly widespread use of supplementary heating (42.4%), primarily in the form of electric heaters (21.1%) or wood-burning devices (22.9%). The two heating systems used most at present are forced air (49.5%) and hot water (39.6%). Finally, it appears that the target houses are generally insulated to acceptable levels (53.7% complete and 36.5% partial).

It is within this context that the problems of the diffusion of natural gas in Quebec must be understood.

Table 1

Sample structure

	Montreal	Quebec City	Sherbrooke	Trois-Rivières	Overall
Size	402	357	326	263	1,348
Anglophones	18.2%	2.8%	4.3%	0%	7.3%
Owner	80.9	91.6	90.1	89.3	87.8
Tenant	18.9	8.4	9.9	10.7	12.2
House under 1,500 ft^2 (166 m^2)	31.1	49.8	45.8	54.8	44.5
House over 1,500 ft^2 (166 m^2)	68.9	50.2	54.2	45.2	55.5
Number of rooms					
4 or less	4.4	3.9	5.4	6.8	4.9
5	17.5	15.2	28.4	41.4	24.2
6	17.8	17.9	13.6	18.1	16.8
7	14.9	8.9	12.9	15.7	13.1
8	15.7	18.2	15.1	8.0	14.7
9 or more	29.8	36.0	24.6	10.0	18.3
Age					
18 - 24	7.8	2.6	7.0	9.6	6.6
25 - 34	15.4	14.3	17.9	16.4	15.9
35 - 44	27.1	25.1	24.0	26.8	25.7
45 - 54	24.2	30.4	22.0	21.2	24.7
55 - 64	16.1	18.1	19.2	14.4	17.1
65 or over	9.4	9.4	9.9	11.6	10.0
Marital status					
Married	80.2	82.2	80.5	82.4	81.3
Single	13.0	10.5	10.4	10.1	11.1
Other	6.9	7.3	9.1	7.6	7.7
Education					
Elementary	11.7	6.8	15.9	15.2	12.1
Secondary	28.5	26.3	39.1	52.6	35.2
CEGEP	14.4	17.5	17.2	13.9	15.8
University	45.5	49.4	27.8	18.3	36.9

Table 1 (cont.)

	Montreal	Quebec City	Sherbrooke	Trois-Rivières	Overall
Sex					
Male	64.9%	72.6%	57.4%	59.7%	64.1%
Female	35.1	27.4	42.6	40.3	35.9
Occupation					
Professional	22.4	30.8	16.9	11.6	21.3
Administrator	17.4	11.3	5.5	6.3	10.6
Sales representative	4.1	6.0	3.1	4.5	4.4
Civil servant	3.5	10.3	2.1	2.3	4.7
Retired	8.8	13.2	10.4	8.7	10.9
Worker	7.3	11.0	17.8	24.5	16.2
Technician	9.6	5.3	7.4	6.3	7.4
Nurse	1.2	1.7	0.3	2.2	1.3
Merchant	4.7	2.0	2.5	3.1	3.2
Student	4.4	1.3	4.0	1.9	3.2
Housewife	13.1	7.3	24.8	17.5	16.6
Other	1.5	0.0	5.2	0.4	0.5
Number of children at home					
None	35.0	24.8	28.8	24.7	26.1
One	17.2	18.8	16.7	22.0	19.1
Two	26.1	32.6	36.9	35.7	33.6
Three	15.4	17.6	11.9	11.0	14.1
Four or more	6.1	6.3	5.8	6.6	6.5
Total family income					
Less than $10,000	7.5	4.8	13.9	11.1	9.0
$10,000-$20,000	15.0	13.1	25.1	25.6	18.9
$20,000-$30,000	20.6	18.3	20.6	24.6	20.7
$30,000-$40,000	16.8	19.9	20.2	22.2	19.7
$40,000-$50,000	14.0	13.8	9.4	11.6	12.2
Over $50,000	26.2	30.1	10.9	4.8	19.5

Table 2

Main Heat Energy Source Used

	Montreal (%)	Quebec City (%)	Sherbrooke (%)	Trois-Rivières (%)	Overall (%)
Energy source					
Oil	70.8	88.5	84.4	83.7	81.8
Wood	0.5	0.8	2.8	3.4	1.7
Natural gas	19.7	0.3	0.3	6.5	7.2
Dual energy	6.0	9.8	12.6	4.2	8.4
Various combinations	2.9	0.6	0.0	0.8	0.5
Propane gas	--	0.3	0.0	0.8	0.3
Existing heating system					
Hot water	44.4	39.2	49.7	16.4	39.6
Forced air	40.1	49.9	42.0	71.6	49.5
Independent wall radiator	4.7	1.7	2.1	5.2	3.2
Supplementary (natural convection)	1.3	2.2	0.3	2.4	1.5
Unknown	4.7	1.1	0.6	1.2	1.9
Other combinations	4.9	5.1	4.0	2.0	3.5
Dwelling insulation					
Full	38.3	51.5	66.0	65.4	53.7
Partial	46.5	40.1	28.2	25.5	36.5
None	6.0	3.1	0.9	0.8	2.9
Unknown	9.2	5.3	4.9	8.4	6.9
Auxiliary heating					
Users	37.3	50.1	35.6	48.5	42.4
Auxiliary heating system					
Electric heater	27.4	28.6	9.2	16.3	21.1
Wood	13.4	23.0	25.2	34.2	22.9

HOW VARIOUS ENERGY SOURCES ARE PERCEIVED

In attempting to understand individuals' energy choices, it is important, as with any other product or service, to find out how the available energy sources are perceived, and what their relative merits and drawbacks are said to be.

Special effort has been made in this study to measure the individual spontaneous perception of the various sources or systems, namely heating oil, electricity, wood, natural gas and the dual-energy system. The results have been particularly interesting and highly significant, because they combine quantitative assessment with the intrinsic value of spontaneous qualitative information. This information was obtained during the unstructured part of the personal interview preceding the self-administered questionnaire phase; it is set out in Table 3.

Electricity

The essential attractions of electric heat are: cleanliness (56.2%) and reliability (25.4%).

On the other hand, its main disadvantages are: high cost (33.4%) and uncomfortable air dryness (22.3%).

Some individuals also mentioned the inconvenience of power failures (13.3%). These results are almost identical for each of the cities.

Oil

For heating oil, results indicate very few advantages other than reliability and evenesss of heat (25.7%). It is clear that the disadvantages of heating oil are perceived as unpleasant odour (45.3%), high cost (33.7%) and bulk (need for storage tanks) [14.7%].

Here again, results among cities are similars.

Table 3

Perception of the Advantages and Disadvantages of Various Energy Sources

	Montreal		Quebec City		Sherbrooke		Trois-Rivières		Overall	
	Responses	%	Responses	%	Responses	%	Responses	%	Responses	%
Electricity										
Advantages:										
Clean, odourless	232	57.7	255	71.4	158	48.5	130	49.4	758	56.2
Safe	28	7.0	33	9.2	24	7.4	23	8.7	111	8.2
Economical	67	16.7	64	17.9	61	18.7	22	8.4	210	15.6
No bulky storage tanks	33	8.2	80	22.4	38	11.6	21	0.8	171	12.7
Quebec product	15	3.7	25	7.0	11	3.4	--	--	45	3.3
Reliable, even heat	101	25.1	115	32.2	64	19.6	63	23.9	342	25.4
Quiet	54	13.4	61	17.1	58	17.8	29	11.0	203	15.0
Secure supply	35	8.7	16	4.5	26	8.0	--	--	89	6.6
Comfort	17	4.2	--	--	--	--	--	--	38	2.8
Disadvantages:										
Expensive	154	38.3	145	40.6	85	26.1	70	26.6	450	33.4
Unreliable, inefficient	21	5.2	36	10.1	15	4.6	--	--	81	6.0
Dryness (air)	99	24.6	--	24.4	56	17.2	68	25.8	301	22.3
Power failures	62	15.4	--	15.4	37	11.3	61	23.2	179	13.3
Expensive to install	23	5.7	--	3.9	17	5.2	--	--	57	4.2
Monopoly price (arbitrary variations)	14	3.5	--	2.8	16	4.9	--	--	41	3.0
Oil										
Advantages:										
Clean	16	4.0	15	4.2	21	6.4	19	4.6	64	4.7
Safe	11	2.7	--	--	12	3.7	--	--	36	2.7
Economical	51	12.7	59	16.5	47	14.4	23	8.7	180	13.3
Reliable, even heat	86	21.4	126	35.3	78	23.9	57	21.7	346	25.7
Secure supply	17	4.2	--	--	28	8.6	--	--	84	6.2
Comfort	30	7.5	16	4.5	--	--	9	3.4	63	4.7

Table 3 (cont.)

	Montreal		Quebec City		Sherbrooke		Trois-Rivières		Overall	
	Responses	%	Responses	%	Responses	%	Responses	%	Responses	%
Disadvantages:										
Odour	177	44.0	194	54.3	121	37.1	164	47.1	611	45.3
Unsafe	22	5.5	18	5.0	--	--	--	--	55	4.1
Expensive	167	41.5	110	30.8	110	33.7	71	27.0	455	33.7
Bulky storage tanks	47	11.7	80	22.4	51	15.6	21	8.0	198	14.7
Uncertain supply	59	14.7	10	2.8	45	13.8	18	6.8	134	9.9
Unreliable, inefficient	39	9.7	30	8.4	21	6.4	13	4.9	101	7.5
Difficult to use	14	3.5	--	--	--	--	--	--	--	--
Non-renewable energy source	14	3.5	--	--	--	--	--	--	--	--
Extreme price variations	11	2.7	--	--	--	--	--	--	35	2.6
Noisy	--	--	32	9.0	26	8.0	32	12.2	103	7.6
Product from outside Québec	--	--	14	3.9	--	--	--	--	--	--
Natural gas										
Advantages:										
Clean, odourless	95	23.6	65	18.2	33	10.1	28	10.6	218	16.2
Safe	11	2.7	--	--	--	--	--	--	--	--
Economical	158	39.3	131	36.7	67	20.5	47	17.9	400	29.7
No bulky storage tanks	15	3.7	16	4.5	--	--	--	--	42	3.1
Reliable, even heat	64	15.9	56	15.7	25	7.7	31	11.8	126	13.0
Secure supply	37	9.2	11	3.1	11	3.4	--	--	67	5.0
Comfort	11	2.7	--	--	--	--	--	--	--	--
Disadvantages:										
Unpleasant odour	48	11.9	27	7.6	17	5.2	18	6.8	103	7.6
Unsafe	154	38.3	95	26.6	88	27.0	65	24.7	398	29.5
Expensive	29	7.2	13	3.6	12	3.7	10	3.8	63	4.7
Unreliable	14	3.5	--	--	--	--	--	--	--	--
Uncertain supply	19	4.7	10	2.8	13	4.0	--	--	44	3.3
Expensive to install	10	2.5	--	--	--	--	--	--	35	2.6

Table 3 (cont.)

	Montreal		Quebec City		Sherbrooke		Trois-Rivières		Overall	
	Responses	%	Responses	%	Responses	%	Responses	%	Responses	%
Wood										
Advantages:										
Clean, odourless	48	11.9	18	5.0	36	11.0	21	8.0	120	8.9
Economical	83	20.6	91	25.5	109	33.4	57	21.7	339	25.1
Reliable, even heat	47	11.7	56	15.7	40	12.3	41	15.6	181	13.4
Good supplementary heating	23	5.7	46	12.9	31	9.5	29	11.0	126	9.3
Ease of supply	11	2.7	10	2.8	--	--	--	--	31	2.3
Comfort	17	4.2	--	--	14	4.3	--	--	43	3.2
Cheerful, traditional	25	6.2	13	3.6	38	11.6	--	--	112	8.3
Energy self-sufficiency	--	--	--	--	15	4.6	--	--	--	--
Disadvantages:										
Odour	91	22.6	132	40.0	104	31.9	108	41.1	432	32.0
Unsafe	59	14.7	84	23.5	73	22.4	54	20.5	267	19.8
Expensive	41	10.2	38	10.6	28	8.6	23	8.7	128	9.5
Bulky	31	7.7	65	18.2	29	8.9	14	5.3	139	10.3
Unreliable	40	10.0	38	10.6	32	9.8	30	11.4	139	10.3
Uncertain supply	87	21.6	--	--	104	31.9	13	4.9	213	15.8
Difficult to use	45	11.2	25	7.0	--	--	--	--	73	5.4
Expensive to install	--	--	--	--	15	4.6	--	--	--	--
Dual Energy System										
Advantages:										
Economical	68	16.9	78	21.8	76	23.3	34	12.9	256	19.0
Reliable, even heat	38	9.4	39	10.9	17	5.2	20	7.6	112	8.3
Supplementary heating	--	--	10	2.8	26	8.0	7	2.7	52	3.8
Disadvantages:										
Unpleasant odour	--	--	11	3.1	--	--	--	--	--	--
Expensive	48	11.9	32	9.0	25	7.7	15	5.7	117	8.7
Expensive to install	25	6.2	15	4.2	24	7.4	--	--	73	5.4
Cumbersome	--	--	11	3.1	--	--	--	--	--	--
Unreliable	--	--	13	3.6	--	--	--	--	--	--

Natural Gas

Perceived advantages of natural are economy (29.7%), cleanliness (16.2%), and reliability and eveness of heat (13.0%).

However, a major obstacle seems to be that it is perceived by some as unsafe (29.5%).

The weakness (in terms of percentages or number of responses) of the findings as a whole indicates, first, a lack of familiarity with natural gas, and consequently a lack of understanding of it, which in turn results in a lack of conviction in the assessment of this energy source.

Wood

Although it is almost never used as a main heating source, wood is used for auxiliary heating and features prominently in the respondents' assessments, since they are very familiar with it. The advantages assigned to wood are economy (25.1%) and reliability (13.4%).

On the other hand, its major disadvantages are perceived to be unpleasant odour (32.0%), lack of safety (19.8%) and uncertainty of supply (15.8%).

The odour-related disadvantage is perceived less in Montreal (22.6%) than elsewhere; the same is true of the safety problem (14.7%, vs 20.5% to 23.5% elsewhere). As for uncertainty of supply, this factor is evident mainly in Sherbrooke (31.9%) and Montreal (21.6%), while in Quebec City and Trois-Rivières the problem is hardly noted.

Dual-Energy System

The dual-energy system proposed recently by Hydro-Québec does not appear to be well known. The main perceived advantage appears to be economy, while no major disadvantage is assigned to it. However, because very few people evaluated dual energy, this assessment reveals little other than that the dual-energy concept is not well known or understood.

It may be concluded, therefore, that electricity and oil remain the two dominant energy sources, with wood and natural gas playing only a secondary role. Natural gas, in contrast to wood, appears to have a promising future since it has been introduced very recently; it is not very well known, and people's opinions osfit do not appear to have been determined as yet.

Heating oil suffers from a perception which is on the whole negative, while electricity, in spite of its advantages of cleanliness and reliability, is still considered an expensive energy source and criticized for drying out the air in the home.

Thus natural gas is not held back because of competition from two superior energy sources. Indeed, it suffers from only one true handicap, the popular perception that it is dangerous. At the same time, it enjoys a slight advantage in potential heating economy. The dual-energy system so far remains a poorly understood hybrid solution.

PENETRATION OF NATURAL GAS

The situation of natural gas in relation to its market potential in the target marketing areas is typical of a recently-introduced new product (Table 4). For this reason, great care must be taken in interpreting penetration rates or market share. A penetration rate is of strategic significance only as applied to its real market potential. However, in order to measure the existing position of natural gas with respect to its market potential, the number of houses converted must be compared with the number of potentially-convertible houses, that is, those presently heated by oil and located in areas with access to natural gas or about to obtain it. This is the potential market examined in the present study.

First, it is noted that a gas diffusion effort is well underway and that it is beginning to penetrate the market. In fact, it is interesting to compare the figures for various cities (Tables 2, 5 and 6) and observe the evolution in the levels of information, knowledge, active search for information, interest and intent to convert to natural gas.

The penetration rate as defined above shows an interesting progression, with percentages of 19.7% in Montreal, 6.5% in Trois-Rivières, 0.3% in Quebec City and 0.3% in Sherbrooke. The same kind of progression is evident on the question of familiarity with gas (34.9% are very familiar with natural gas in Montreal, 18.9% in Trois-Rivières, 15% in Quebec City and 12% in Sherbrooke) and on information held on this type of energy (13.3% are well informed in Montreal and 8.8% in Trois-Rivières, but only 4.0% and 1.7% in Sherbrooke and Quebec City respectively).

Table 4

Knowledge of Natural Gas

	Montreal (%)	Quebec City (%)	Sherbrooke (%)	Trois-Rivières (%)	Overall (%)
Familiarity with gas:					
High	34.9	15.0	12.0	18.9	20.9
Has heard about it	44.8	57.6	39.1	52.0	47.8
None	19.9	27.4	48.9	30.1	31.3
Level of information on gas:					
High	13.3	1.7	4.0	8.8	7.1
Fairly high	24.8	18.8	11.8	29.3	19.2
Low	30.5	35.5	21.4	21.3	29.1
None	31.4	43.9	62.7	40.5	34.5
Source of information:					
Information booth	5.0	4.5	3.1	10.3	5.5
Friends or relatives	31.8	23.2	14.7	24.7	24.4
Representative	16.2	3.4	3.1	12.2	9.0
Brochure	21.7	10.4	7.4	16.0	14.1
Television	26.4	31.4	26.7	30.8	29.2
Radio	16.2	17.6	12.6	15.6	15.9
Newspapers	31.6	41.7	27.0	32.7	34.0
Billboard	7.5	5.3	5.2	5.3	6.1
Magazines	14.7	15.4	6.7	8.0	11.8
Have been approached about conversion:					
Remember having been approached	35.8	31.7	18.1	24.3	28.3
By Gaz Métropolitain	14.9	--	--	--	4.4
By Flamidor	--	4.5	--	--	--
By Hydro	4.7	2.8	3.4	1.9	3.3
By Inter-Cité	--	0.6	0.3	5.3	1.3
To dual energy	5.5	14.0	7.7	2.7	7.7
To electricity	5.0	12.3	8.6	3.0	7.4
To gas	21.4	2.2	0.3	14.1	9.8

Table 4 (cont.)

	Montreal (%)	Quebec City (%)	Sherbrooke (%)	Trois-Rivières (%)	Overall (%)
Know of people who use gas:	58	18.5	13.2	33.5	31.6
Level of satisfaction of people they know:*					
Very satisfied	17.7	6.4	4.3	9.5	10.4
Satisfied	26.6	7.6	7.7	13.7	15.1
Somewhat satisfied	5.7	1.1	0.9	3.0	2.8
Not particularly or not at all satisfied	1.7	0.6	0.0	1.2	0.9
Reasons for their satisfaction:					
Reliability	8.7	3.6	3.4	6.5	5.8
Economy	17.4	5.6	4.3	6.0	9.5
Cleanliness	9.5	3.0	--	6.1	5.4

*The others do not know or are not concerned.

Table 5

Interest in Gas

	Montreal	Quebec City	Sherbrooke	Trois-Rivières	Overall
Intention to use gas:					
Yes	11.4	13.7	9.5	10.6	12.2
Undecided	15.9	20.3	17.5	16.0	21.1
No	15.9	27.2	22.4	39.5	33.3
When:					
In the summer of 1983	2.0	3.9	0.6	3.4	2.5
When available	2.7	4.8	5.8	1.9	3.9
Contact with a distributor	14.4	1.1	0.9	8.0	6.7
Does not apply or did not answer	34.8	28.9	50.6	33.8	33.4
Area	45.8	0.6	2.5	29.3	19.7
Attempt to obtain information on gas	27.1	10.4	8.6	19.8	16.9
Has taken steps to adopt gas heat	21.1	9.5	5.5	14.4	13.1

Table 6

Interest in Converting to a New Energy Source

	Montreal	Quebec City	Sherbrooke	Trois-Rivières	Overall
Very interested	8	15.1	9.8	9.1	10.6
Interested	10.7	20.4	12.6	12.9	14.3
Somewhat interested	11.5	11.5	10.4	8.0	10.4
Not particularly interested	8.0	5.3	4.9	8.0	6.4
Not interested	17.4	9.0	8.9	17.1	12.9
Don't know	44.5	38.7	53.4	44.8	43.7
Interest or strong interest in conversion to					
Electricity	10.1	22.7	20.8	22.0	21.1
Wood	7.0	3.6	7.7	3.8	5.6
Natural gas	10.9	22.9	17.2	12.9	16.1
Propane gas	2.4	2.5	1.8	1.6	2.1
Dual energy	9.7	13.7	10.7	3.8	9.9

A clear difference can thus be observed between Montreal, where natural gas was introduced some years ago, Trois-Rivières, where natural gas has only recently become available but where a marketing effort is underway, and Quebec City and Sherbrooke, where natural gas is not yet available, but will be in the near future.

Furthermore, the proportion of people who have been approached in the various areas about converting to gas shows the same progression: 21.4% in Montreal, 14.1% in Trois-Rivières, 2.2% in Quebc City and 0.3% in Sherbrooke.

Another indication of the market penetration of natural gas is the proportion of respondents who know people using natural gas: 58% in Montreal, 33.5% in Trois-Rivières, 18.5% in Quebec City and 13.2% in Sherbrooke. The last two percentages show that information dissemination occurs even from one city to another.

On the subject of expressed intent to convert to natural gas, the results are not as clear. Even though there is a proportion of people in each city who have made up their mind, there remain inter-city variations which cannot be properly explained and which could be due to particular local circumstances not analyzed in the present study. It must also be borne in mind that every intent is associated with a time horizon, and that as time passes and information circulates, these proportions can change. They represent a temporary condition present at a given point in time and not a given condition constant in time.

The strength of the intention can also vary; in Montreal only 11.4% are specific intentions, a percentage very similar to that in the other cities, with a slightly smaller number of people hesitating; Montreal has the smallest percentage of people responding negatively and the highest percentage of people who have contacted their gas distributor (14.4%, as opposed to 8.0% in Trois-Rivières, 1.1% in Quebec City and 0.9% in Sherbrooke).

Another factor of interest is the proportion of people who have natural gas available in their area (and are aware of the fact): 45.8% in Montreal, 29.3% in Trois-Rivières, and 2.5 and 0.6% in Quebec City and Sherbrooke respectively (people are ahead of events in the case of the last two cities.).

There is also a relationship between the intent to use gas and the search for information about it. This relationship is stronger in Montreal (among those intending to use gas, 65.2% have tried to obtain information), but it does not exist in the other three cities (among those intending to use gas, 58.9% have not tried to obtain information). This is undoubtedly due to the fact that in the three other cities, people have not yet reached the phase of actively seeking out information.

There is also a relationship between the actions taken to obtain gas and the intention to use it. Once again, this relationship is stronger in Montreal and is not present in the other three regions (among those intending ot use gas, 56.7% have not taken any action).

These observations suggest the existence of various intensity levels in the intent to use gas, which express themselves in terms of different information-seeking behaviour and actions.

It was found that 33.6% of respondents claimed the man made the decisions with respect to energy; it should also be noted that, of those giving this answer, 80.1% were men. Furthermore, of the 11.5% who say it is the woman who makes decisions, 82.9% are women. Finally, 55% of respondents claim the decision is made jointly, but it is mainly men who give this answer (64.5%).

It is also observed that the intention to use gas is more widespread among men than women. The percentage of positive intent is 20.3% among men, compared to 14.5% among women.

The figures on interest in converting to gas (Table 7) confirms somewhat the trend observed in those for intention to convert, with the slight nuance that the interest is usually greater than the specific and concrete intent. However, the slump in the proportion of expressed intent and even interest suggests that, in Montreal, diffusion may well have already reached the top it its curve in the present target areas and that the market has already peaked, possibly prematurely. Indications are not clear, but the evolution of the conversion rate should be followed closely to determine whether the curve slope is in fact showing signs of a decline.

PERCEIVED ADVANTAGES AND DISADVANTAGES OF NATURAL GAS

Diffusion of innovation is facilitated or accelerated by the product's attractive qualities and slowed by its disadvantages. As noted above, natural gas has a serious disadvantage, namely a perceived lack of safety. At the same time, it has no spontaneously cited advantages other than the potential for saving on heating costs. And, with Hydro-Québec's present offensive and declining international petroleum prices, there is a danger that this perception of potential savings through the use of natural gas will itself decline.

The fears which people associate with natural gas are presented in Table 8. Once again, the predominant spontaneous fears are associated with safety. The overall way in which natural gas is perceived has also been measured, and is presented in Table 9. It may be observed from this table that gas is generally perceived as having a definite relative advantage (34.4%), saving on heating costs (36.5%), meeting household energy needs (31.3%), being a clean form of energy (4.74%) and in general being a good source of energy (48.6%).

Table 7

Awareness of Subsidies

	Montreal	Quebec	Sherbrooke	Trois-Rivières	Overall
Awareness that conversion subsidies exist and estimate the % subsidized at:	48.0	38.9	29.4	51	41.4
0 to 20%	2.2	1.7	0.9	0.8	1.4
21 to 40%	7.0	2.2	1.2	1.5	3.2
41 to 60%	12.2	7.0	7.7	6.8	8.7
61 to 80%	1.5	4.8	4.0	4.9	3.7
81% or more	46.3	57.1	69.3	44.9	54.7
Don't know	30.8	27.2	16.9	41.1	28.4
Estimate of the grant:					
1 to $200	2.2	4.8	3.4	1.5	3.0
201 to $400	1.7	2.8	2.5	3.0	2.5
401 to $600	4.7	6.2	1.8	2.7	4.0
601 to $800	1.0	0.3	2.5	0.4	1.0
801 to $1,000	1.7	6.4	5.2	0.0	3.5
1,001 to $2,000	1.7	1.7	2.1	0.8	1.6
Don't know	86.8	68.4	81.5	71.1	84.0
Interest in subsidized conversion to gas:					
Very interested	10.2	19.9	14.4	8.0	13.4
Interested	9.2	17.1	11.0	8.0	11.5
Somewhat interested	10.7	16.2	8.0	11.0	11.4
Not interested	25.3	11.2	10.4	26.6	18.6
Don't know	41.8	33.1	56.1	46.4	45.1

	Montreal		Quebec		Sherbrooke		Trois-Rivières		Overall	
Reasons for the interest	Responses	%	Responses	%	Responses	%	Responses	%	Responses	%
Less expensive	26	6.4	60	16.8	39	11.9	11	4.2	134	100
Reasons for lack of interest:										
Unsafe	28	6.9	14	3.9	13	4.0	16	6.1	70	5.2
Satisfied with present system	28	6.9	15	4.2	19	5.8	19	7.2	79	5.9
Future price increases	15	3.7	-	-	-	-	-	-	29	2.1
Cost of converting	-	-	25	7.0	-	-	-	-	37	2.8

Table 8

Fears Associated with Natural Gas

	Montreal		Quebec		Sherbrooke		Trois-Rivières		Overall	
	Responses	%	Responses	%	Responses	%	Responses	%	Responses	%
Lack of information	10	2.5	28	7.8	20	7.6	13	4.9	70	5.2
Unsafe	82	20.4	76	21.3	67	25.4	34	12.9	254	18.8
Cost of converting	17	4.2	24	6.7	-	-	-	-	56	4.1
Expensive	12	3.0	13	3.6	-	-	-	-	29	2.1
Odour	21	5.2	-	-	13	4.9	-	-	42	3.1
Future increases	23	5.7	-	-	13	4.9	13	4.9	58	4.3

Table 9

How Gas is Perceived

	Montreal	Quebec City	Sherbrooke	Trois-Rivières	Overall
Gas has a relative advantage					
Don't agree at all	6.8	2.8	2.3	10.8	5.2
Disagree	4.2	4.0	4.3	4.5	4.3
Agree somewhat	25.1	25.9	14.2	22.1	21.9
Agree	28.5	26.2	19.1	20.7	24.0
Strongly agree	12.4	11.4	9.2	7.2	10.4
Don't know	22.9	29.6	50.8	34.7	34.2
Gas is a complex product					
Don't agree at all	18.4	19.7	11.1	16.3	16.6
Disagree	15.2	15.2	9.5	14.4	13.5
Agree somewhat	21.3	21.3	14.6	13.4	18.3
Agree	16.9	10.5	9.5	13.9	12.5
Strongly agree	5.0	3.5	2.7	5.3	4.0
Don't know	23.3	29.8	52.4	36.8	35.1
Gas is dangerous					
Don't agree at all	12.7	12.6	6.3	12.1	10.9
Disagree	14.1	13.5	9.6	7.0	11.5
Agree somewhat	19.2	22.8	12.9	17.2	18.3
Agree	17.5	14.5	9.6	19.5	14.9
Strongly agree	13.8	7.7	10.9	8.4	10.3
Don't know	22.6	28.9	50.8	35.8	34.1
The price of gas will increase considerably					
Don't agree at all	5.3	5.7	3.0	4.1	4.5
Disagree	10.0	12.9	6.0	4.1	8.6
Agree somewhat	21.8	26.1	18.1	17.1	21.1
Agree	20.6	16.0	11.4	23.4	17.4
Strongly agree	18.8	9.7	10.0	16.7	13.7
Don't know	23.5	29.6	51.5	34.7	34.6

Table 9 (cont.)

	Montreal	Quebec City	Sherbrooke	Trois-Rivières	Overall
Gas heating equipment is complicated					
Don't agree at all	23.3	17.6	13.4	25.2	19.8
Disagree	23.9	24.3	12.0	17.9	19.9
Agree somewhat	19.3	21.7	16.5	17.0	18.8
Agree	8.1	5.1	3.4	2.8	4.9
Strongly agree	2.3	1.3	1.7	1.8	1.8
Don't know	23.1	30.0	52.9	35.3	34.9
Installation of a gas system is very expensive					
Don't agree at all	9.7	6.8	5.6	12.6	8.5
Disagree	20.0	18.4	13.7	13.5	16.7
Agree somewhat	29.7	33.3	19.4	26.0	27.3
Agree	14.7	9.7	5.6	10.7	10.3
Strongly agree	2.4	1.3	1.4	1.4	1.7
Don't know	23.5	30.4	54.2	35.8	35.5
Gas carries the risk of explosion					
Don't agree at all	5.1	7.5	33.0	7.9	5.9
Disagree	8.2	9.7	3.0	6.0	6.9
Agree somewhat	12.1	13.1	7.4	8.8	10.7
Agree	27.7	23.4	18.4	25.1	23.6
Strongly agree	24.3	16.9	16.4	16.3	18.7
Don't know	22.6	29.4	51.5	35.8	34.4
Conversion to gas is a radical change					
Don't agree at all	15.4	8.8	9.8	8.8	10.9
Disagree	14.5	12.1	9.1	10.9	11.8
Agree somewhat	22.3	30.3	14.6	21.2	22.3
Agree	14.8	11.8	9.4	14.5	12.5
Strongly agree	7.9	5.4	3.5	4.7	5.3
Don't know	25.2	31.6	53.7	39.9	37.3

Table 9 (cont.)

	Montreal	Quebec City	Sherbrooke	Trois-Rivières	Overall
Use of gas saves on heating costs					
Don't agree at all	4.4	2.2	2.4	5.7	3.5
Disagree	7.3	5.4	3.0	4.3	5.0
Agree somewhat	27.0	20.8	12.5	17.5	19.8
Agree	26.5	24.9	18.6	26.5	24.0
Strongly agree	11.6	16.6	11.5	9.5	12.5
Don't know	23.3	30.0	52.0	36.5	35.0
Gas meets requirements					
Don't agree at all	4.7	4.2	3.7	3.8	4.2
Disagree	5.6	4.8	3.4	3.8	4.3
Agree somewhat	29.2	31.4	14.9	23.4	25.0
Agree	29.2	23.7	17.9	23.4	23.9
Strongly agree	7.7	5.8	8.1	8.6	7.4
Don't know	23.6	30.1	52.0	36.8	35.2
Gas is clean					
Don't agree at all	2.3	1.8	1.7	2.3	2.0
Disagree	7.5	3.4	4.0	0.5	4.1
Agree somewhat	14.1	14.2	9.1	9.3	12.1
Agree	33.9	29.5	20.1	34.9	29.1
Strongly agree	19.3	22.2	13.4	17.2	18.3
Don't know	23.0	28.9	51.7	35.8	34.4
Gas has an unhealthy odour					
Don't agree at all	19.7	19.6	13.4	20.9	18.5
Disagree	23.1	21.4	11.7	15.2	18.2
Agree somewhat	18.2	18.6	13.1	18.5	16.9
Agree	9.5	7.1	6.4	5.7	7.4
Strongly agree	6.4	4.0	3.7	3.3	4.4
Don't know	23.1	29.2	51.7	36.5	34.6

Table 9 (cont.)

	Montreal	Quebec City	Sherbrooke	Trois-Rivières	Overall
Heating with gas permits substantial savings					
Don't agree at all	5.6	3.8	2.4	4.8	4.2
Disagree	11.1	10.2	5.1	8.6	8.8
Agree somewhat	34.5	26.5	20.9	28.1	27.6
Agree	17.8	19.2	13.9	15.2	16.7
Strongly agree	7.6	10.2	5.7	6.7	7.7
Don't know	23.4	30.0	52.0	36.7	35.1
Conversion to gas is heavily subsidized					
Don't agree at all	3.2	2.3	1.4	2.4	2.4
Disagree	5.3	4.9	5.0	1.9	4.5
Agree somewhat	30.4	32.1	16.9	20.6	25.4
Agree	25.4	22.0	15.5	26.8	22.4
Strongly agree	12.1	7.9	5.8	11.5	9.3
Don't know	23.6	30.8	55.4	36.8	36.1
Gas is a very good source of energy					
Don't agree at all	2.0	1.5	1.3	1.4	1.6
Disagree	3.5	2.8	1.7	2.3	2.6
Agree somewhat	16.7	10.2	9.1	15.5	12.8
Agree	38.6	39.2	21.2	29.1	32.5
Strongly agree	16.4	17.3	14.8	15.5	16.1
Don't know	22.8	28.9	51.7	35.8	34.4
Gas is highly subject to interruptions in distribution					
Don't agree at all	20	12.3	8.9	16.5	14.5
Disagree	25.8	20.3	.67	17.5	18.5
Agree somewhat	20.3	26.5	20.9	20.5	22.0
Agree	7.5	8.4	5.5	25.5	6.9
Strongly agree	3.2	2.3	2.4	1.0	2.4
Don't know	23.2	30.3	52.7	39.0	35.6

Table 9 (cont.)

	Montreal	Quebec City	Sherbrooke	Trois-Rivières	Overall
Gas as a resource is plentiful					
Don't agree at all	1.4	1.9	0.3	1.4	1.3
Disagree	2.3	1.5	1.7	0.9	1.6
Agree somewhat	13.4	9.9	6.4	11.3	10.3
Agree	34.3	28.5	21.2	28.8	28.3
Strongly agree	25.7	29.1	18.5	20.8	23.9
Don't know	22.9	29.1	51.9	36.8	34.6
The gas system is a modern concept					
Don't agree at all	5.5	7.1	4.1	7.1	5.9
Disagree	8.6	4.0	3.7	2.9	4.9
Agree somewhat	21.6	21.8	7.1	23.3	18.4
Agree	30.0	26.2	21.3	21.0	25.1
Strongly agree	11.2	12.0	11.8	8.6	11.0
Don't know	23.1	28.9	52.0	37.1	34.7
Gas uses advances technology					
Don't agree at all	5.2	7.3	4.8	5.7	5.8
Disagree	13.1	7.3	4.8	6.1	8.1
Agree somewhat	28.0	28.2	11.0	22.2	22.5
Agree	22.7	18.0	18.5	22.6	70.3
Strongly agree	7.6	9.5	8.2	6.6	8.1
Don't know	23.3	29.7	52.7	36.8	35.2
Gas has many uses					
Don't agree at all	1.8	1.6	1.4	2.4	1.7
Disagree	3.0	2.2	2.7	1.0	2.3
Agree somewhat	18.8	15.9	9.5	14.4	14.7
Agree	39.1	33.0	24.8	34.1	32.9
Strongly agree	13.4	17.5	9.2	10.6	12.9
Don't know	23.9	29.8	52.4	37.5	35.4

Table 9 (cont.)

	Montreal	Quebec City	Sherbrooke	Trois-Rivières	Overall
Gas provides constant heat					
Don't agree at all	1.7	1.6	0.7	1.5	1.4
Disagree	3.2	2.5	0.7	1.5	2.0
Agree somewhat	17.6	17.7	8.6	9.7	13.9
Agree	40.6	35.3	25.1	35.4	34.1
Strongly agree	13.8	13.2	12.0	15.0	13.4
Don't know	23.1	29.7	52.9	37.9	35.2
Gas is recommended by experts					
Don't agree at all	2.7	1.3	3.2	3.9	2.7
Disagree	3.6	3.3	1.4	3.4	2.9
Agree somewhat	35.5	30.8	18.1	27.0	28.2
Agree	24.9	24.9	16.0	20.1	21.9
Strongly agree	9.8	8.9	6.5	7.4	8.2
Don't know	23.7	30.8	54.8	38.2	36.2
Gas provides great comfort					
Don't agree at all	2.6	2.2	2.4	1.5	2.3
Disagree	4.7	1.0	1.7	2.9	2.5
Agree somewhat	33.4	27.9	16.0	24.8	25.6
Agree	25.3	30.5	19.4	22.8	24.9
Strongly agree	10.8	9.6	8.2	10.2	9.4
Don't know	23.3	29.87	52.4	37.9	35.3

In addition, natural gas is considered to be a plentiful resource (52.2%), a modern concept (36.1%), an advanced technology (28.4%) and a source of energy recommended by experts (30.1%). Finally, people perceive gas as an energy source which provides constant heat (47.5%) and great comfort (34.3%) and which has many uses (45.8%). Only 6.9% of people are unaware that conversion to natural gas is subsidized.

People perceive natural gas as a simple product (30.1%) and they do not consider gas equipment to be complicated (39.7%). Neither do they consider the installation of a gas system to be expensive (25.2% disagree, and 27.3% think it is somewhat expensive). Only 17.8% of individuals consider conversion to gas to be a radical change, and few (11.8%) find that gas has an unhealthy odour. Risk of distribution interruptions is perceived by only 9.3% of respondents.

However, gas is perceived as being dangerous by a considerable number of respondents (25.2%) and some also expect a considerable future increase in the price of gas (31.1%).

Thus a high proportion (30% to 35%) of the potential customers concerned have a very favourable view of natural gas as an energy source, even though it has been introduced only recently. The only two negative points attributed to it are the perceived safety risk and the expectation of considerable price increases in the future, which would offset the economic advantages of converting.

People intending to use gas differ in some of their beliefs from those not intending to do so. They believe more strongly than the others that:

° gas has a relative advantage over other energy sources (83.8% agree or strongly agree, vs. 34.6%);

° the use of natural gas saves on heating costs (78.7% agree or strongly agree, vs. 40.6%);

° natural gas meets home heating requirements (77.9% agree or strongly agree, vs. 34.1%);

° natural gas is clean (82% agree or strongly agree, vs. 60.8% — even the majority of those not intending to use gas believe this to be true);

° heating with gas permits substantial financial savings (60% agree or strongly agree, vs. 21.8%);

° natural gas is a very good source of energy (88.2% agree or strongly agree, vs. 61.1%: again, this belief is strong even among those not intending to use gas);

° natural gas is an energy source with very plentiful reserves (86.8% agree or strongly agree, vs. 76.2% — also a high proportion);

° a natural gas heating system is modern (64.5% agree or strongly agree, vs. 68.3% — also a high proportion);

° natural gas has highly varied uses (73.5% agree or strongly agree, vs. 68.3% — also a high proportion);

° natural gas gives constant heat (81% agree or strongly agree, vs. 66.6% — also a high proportion);

° natural gas is an energy source recommended by experts (61.2% agree or strongly agree, vs. 37%);

° natural gas provides great comfort (71.6% agree or strongly agree, vs. 39.6%).

On the other hand, people intending to use gas believe less strongly than the others that:

° natural gas is a complex product (16.6% agree or strongly agree, vs. 28.7%);

° natural gas is dangerous (13.4% agree or strongly agree, vs. 50.7%);

° the price of natural gas will increase considerably over the next few years (20.2% agree or strongly agree, vs. 61.7%);

° natural gas heating equipment is difficult to install, maintain and repair (5.7% agree or strongly agree, vs. 13.4%);

° it is very expensive to install a natural gas heating system (14% agree or strongly agree, vs. 22.5%);

° natural gas is explosive (51.4% agree or strongly agree, vs. 70.4%);

° natural gas has an unhealthy odour (14.2% agree or strongly agree, vs. 20.9%);

° natural gas is highly subject to interruptions in distribution (7.4% agree or strongly agree, vs. 15.4%).

Looking at this data from another point of view, it is of interest to note that the most positive opinions of those intending to use gas are, in order of precedence, that natural gas:

. is a very good energy source;

. is an energy source with plentiful reserves;

. has a relative advantage over other sources of energy;

. is a clean energy source; and

. gives constant heat.

On the other hand, the most negative opinions of those not intending to use gas are,, in order, that natural gas:

. is explosive;

. is dangerous;

. prices will increase considerably over the next few years.

Men and women vary with respect to certain opinions regarding natural gas. It seems that more men than women are of the opinion that:

° natural gas has a relative advantage over other energy sources (55.9% of men agree or strongly agree, vs. 44.8% of women);

° natural gas is explosive (66% of men agree or strongly agree, vs. 60.7% of women);

° use of natural gas saves on heating costs (59.7% of men agree or strongly agree, vs. 48.3% of women);

° natural gas is a clean energy source (76.1% of men agree or strongly agree, vs. 63.5% of women);

° natural gas is a very good source of energy (77.7% of men agree or strongly agree, vs. 65.1% of women);

° natural gas is an energy source with very plentiful reserves (83.1% of men agree or strongly agree, vs. 71.3% of women);

° natural gas has highly diversified uses (75.7% of men agree or strongly agree, vs. 67.1% of women).

On the other hand, more women than men are of the opinion sthat:

° natural gas heating equipment is difficult to install, maintain and repair (14% of women agree or strongly agree, vs. 8.3% of men);

° natural gas has an unhealthy odour (26.7% of women agree or strongly agree, vs. 15.1% of men).

There is a significant relationship between level of education and certain ideas about natural gas. In fact, it appears that the higher the level of education, the more an individual tends to believe that natural gas has a relative advantage over other energy sources.

However, the relationship is inversely proportional with respect to the opinion that the price of natural gas will increase considerably over the next few years.

The criteria by which individuals assess energy sources also determine the acceptance of a new energy source. The present study has measured these evaluation criteria (Table 10).

Whereas comfort, lack of odour, cleanliness, assured availability, installation costs and heating costs are all very important, the safety factor is the most important by far. The first criteria listed give an undeniable advantage to natural gas, but the safety aspect (together with the negative attitudes engendered by its application), creates a disadvantage for, and could even prevent the adoption of, natural gas and should therefore be the subject of special attention and effort.

Men and women do not differ in the importance they assign to certain criteria used in selecting an energy source.

However, there is a significant and proportional relationship between level of education and the importance of certain safety-related criteria used in selecting an energy source: the higher the level of education, the more important is this characteristic. Nevertheless, the gap between the various educational levels is small.

KNOWLEDGE ON NATURAL GAS

The degree of knowledge and understanding of an innovation is generally a determining factor in the way individuals perceive it. As they become more familiar with the new product, and come to understand it better, the perceived risk involved in the change which is always implicit in the adoption of an innovation, decreases.

In fact, knowledge of natural gas remains weak or non-existent in major parts of the target market (47% weak and 31.3% non-existent), even in Montreal. Popular opinion of natural gas is already generally favourable: improved knowledge would certainly enhance it, and might be able to diminish the perceived risk. Information is derived mainly from newspapers (34%), television (29.2%), friends and relatives (24.4%), and radio (15.7%), but direct soliciting has remained relatively weak.

A fairly high proportion of respondents know people who use gas (31.6%), and they are generally satisfied.

The existence of a subsidy program is also generally well known (41.4%), even to the point of the percentage subsidized. On the other hand, people are generally unaware of the amounts involved (84%).

Table 10

Evaluation Criteria for an Energy Source

	Montreal	Quebec City	Sherbrooke	Trois-Rivières	Overall
Importance of various elements					
Comfort					
Very little importance	1.7	0.6	1.3	0.9	1.2
Little importance	0.6	0.6	1.3	0.5	0.7
Somewhat important	7.2	2.1	4.4	2.8	4.4
Important	22.7	27.3	21.6	26.1	24.4
Very important	67.9	69.4	71.4	69.7	69.4
Odour					
Very little importance	3.1	1.2	3.2	1.4	2.3
Little importance	1.7	3.1	3.5	1.4	2.5
Somewhat important	5.3	6.5	7.1	3.9	5.9
Important	25.5	32.7	28.2	24.6	28.2
Very important	64.4	56.6	58.0	68.6	61.1
Safety					
Very little importance	1.1	0.6	1.3	1.4	1.1
Little importance	0.8	0.0	1.0	0.0	0.5
Somewhat important	2.2	1.8	1.9	1.4	1.9
Important	11.3	13.5	9.6	9.5	11.2
Very important	84.6	84.1	86.3	87.6	85.4
Cleanliness					
Very little importance	1.1	0.9	1.0	2.0	1.2
Little importance	0.8	0.6	1.9	0.0	0.9
Somewhat important	5.3	3.9	5.1	2.9	4.5
Important	26.6	34.0	28.3	27.8	29.4
Very important	66.2	60.5	63.7	67.3	64.0

Table 10 (cont.)

	Montreal	Quebec City	Sherbrooke	Trois-Rivières	Overall
Availability					
Very little importance	1.1	0.6	2.3	3.0	1.6
Little importance	0.8	0.6	2.3	1.0	1.2
Somewhat important	7.3	5.2	4.8	8.6	6.4
Important	23.1	27.3	28.1	27.8	26.2
Very important	67.6	66.3	62.6	59.6	64.6
Installation cost					
Very little importance	2.6	0.9	1.6	5.5	2.4
Little importance	2.0	2.7	2.9	3.0	2.5
Somewhat important	15.2	11.2	5.8	11.1	11.1
Important	28.4	24.3	29.2	25.1	26.9
Very important	51.9	60.8	60.4	55.3	57.0
Heating cost					
Very little importance	2.3	0.9	1.6	3.4	1.9
Little importance	1.1	0.6	1.3	1.0	1.0
Somewhat important	6.8	3.4	2.6	8.8	5.1
Important	19.8	20.8	18.5	23.0	20.3
Very important	70.1	74.3	76.0	63.7	71.6
Modern equipment					
Very little importance	6.9	8.7	11.2	6.6	8.5
Little importance	9.7	11.5	11.6	7.1	10.4
Somewhat important	25.7	20.6	22.8	26.8	23.7
Important	24.9	26.8	25.4	27.3	25.9
Very important	32.9	32.4	29.0	32.3	31.5

There is a significant relationship between the degree to which people are informed on natural gas and some opinions held on the subject. First, it would appear that the more information people have on natural gas, the more likely they are to believe that it:

. has an advantage over other energy sources;

. saves on heating costs;

. meets individuals' needs;

. is clean;

. permits substantial financial savings;

. conversion to is heavily subsidized;

. is a very good energy source;

. has plentiful reserves;

. heating systems are modern;

. uses advanced technology;

. has highly diverse uses;

. gives constant heat;

. is an energy source recommended by experts; and

. provides great comfort.

On the other hand, it is clear that the more information people hold on natural gas, the less likely they are to believe that:

. natural gas is dangerous;

. the price of natural gas will increase considerably over the next few years;

. natural gas heating equipment is difficult to install, maintain and repair;

. conversion to natural gas is a radical change; and

. the natural gas distribution system is subject to frequent interruptions.

It may also be noted that there is a significant relationship between the level of knowledge on the subject of natural gas and the intention to use it. In fact, 36.2% of those claiming to have a good knowledge of natural gas intend to use it, while only 12% of those who have "heard about it" intend to use it. Furthermore, individuals intending to use gas claim to be better informed on the subject than those not intending to do so.

It is of interest to observe the directly proportional relationship existing between the intent to use gas and the degree of effort expended to obtain information on the subject. In fact, among those intending to use gas, 53% have tried to obtain information, as compared to only 16.1% for those not intending to use it.

A significant and directly proportional relationship also exists between taking steps to obtain information on access to natural gas and the intention to use it. Those who have taken such steps are those most likely to use gas.

MASS AND INTERPERSONAL COMMUNICATIONS ON ENERGY

Mass or interpersonal communications are generally the key to innovation diffusion. Mass communication stimulates interest, but it is the interpersonal communication (word-of-mouth) which persuades and which directly affects perception and eveluation. People's interest in this field and their desire to obtain information and discuss the subject will, in general, tend to encourage communication.

In fact, as Table 11 shows, the topic of energy elicits a great deal of interest among the respondents (56.4%) and they generally enjoy talking about it (53.1%). Yet most confirm they do not know much about it (71.5%) and are unable to provide much information to others (94.6%). Furthermore, most consider themselves to be consulted less than others (52.2%) and prefer to listen rather than persuade during discussions on energy (74.2%), and only 32.1% of them confirm giving advice to others. This situation confirms that leadership of opinion and the holding of transmittable information exist only in a minority of the population.

The present study appears to indicate, however, that for natural gas, in contrast to other innovations, perhaps because of its technical aspects, mass communication is generally more credible than interpersonal communication, especially when the source is an expert or impartial organization (Consumer Protection Bureau 58.2%, and Ministry of Energy and Resources 36.5).

Table 11

Interest in Energy, and Opinion Leadership

	Montreal	Quebec City	Sherbrooke	Trois-Rivières	Overall
Interest					
None	9.8	5.4	7.4	8.2	7.7
Little	12.7	8.0	13.9	9.9	11.1
Some	25.4	23.7	22.6	28.4	24.7
Fair amount	31.9	41.7	31.3	32.5	34.7
Enjoys talking about energy	50.0	50.4	55.2	55.6	53.1
Has knowledge in the energy field					
None	11.1	10.8	15.5	14.9	12.7
Little	23.6	21.4	28.0	23.0	24.1
Some	34.7	40.2	26.7	37.1	34.5
Fair amount	25.4	24.8	24.2	21.8	24.4
A great deal	5.7	2.8	5.6	3.2	4.3
Information supplied on energy					
Very little	54.2	60.8	57.3	53.7	56.7
Average	40.4	36.6	34.3	40.6	37.9
A great deal	5.5	2.6	8.4	5.7	5.4
Consultation on energy					
Less consulted than others	47.5	53.9	55.3	52.5	52.2
As consulted as others	44.0	42.0	32.4	41.9	40.0
More consulted than others	8.5	4.2	12.3	5.5	7.8
Attitude during discussions on energy					
Listens	70.7	73.1	78.3	77.0	74.2
Persuades	29.3	26.9	21.7	23.0	25.8

Table 11 (cont.)

	Montreal	Quebec City	Sherbrooke	Trois-Rivières	Overall
Direction of advice					
Advises others	35.3	34.5	21.8	26.6	32.1
Receives advice	36.8	44.0	46.6	41.8	42.1
Don't know	27.9	21.6	23.6	31.6	25.9
Perceived as a good source of information and advice					
Yes	31.3	27.2	35.6	28.9	30.9
No	52.0	60.5	58.3	57.4	56.7
Don't know	16.7	12.3	6.1	13.7	12.5
Energy information sources					
Newspapers	70.3	82.4	69.0	74.1	73.3
Magazines	34.9	41.5	25.2	20.5	31.2
Television	59.0	61.9	63.5	67.3	62.1
Radio	37.9	30.5	30.4	37.5	33.5
Friends and relatives	25.6	18.8	23.6	17.9	21.7
Associations	8.5	6.7	10.1	9.2	8.4
Information sources on gas considered to be credible					
Gas distributor	7.5	8.4	4.3	8.7	7.2
Federal Government	24.4	40.3	23.9	22.8	28.2
Provincial Government	14.2	22.7	14.4	13.7	16.4
Ministry of Energy and Resources	34.8	41.5	31.0	38.8	36.5
Consumer Protection Bureau	60.7	57.4	58.3	55.1	58.2
Books on the subject	5.5	2.5	4.3	--	3.4

Those who enjoy talking about energy are fairly numerous (53.1%). However, this proportion varies with the main source of energy used. In fact, there are fewer affirmative replies among those whose main energy source is oil (only 33.3% of these individuals enjoy talking about energy), than among those using natural gas (57.9%), dual-energy systems (60%), and wood (72.7%).

More people provide very little information on energy to their friends (56.7%) than an average amount (37.9%) or a great deal (5.4%). At the same time, this proportion varies somewhat with the main energy source employed. In fact, those using mainly wood and natural gas provide slightly more information than others.

Most individuals (74.2%) are more likely to listen to the ideas of others in a discussion on energy with friends than to try and persuade them on the basis of their own ideas. At the same time, this behaviour pattern appears to vary with the main energy source employed. This pattern is stronger among those using gas (77.1% would rather listen) or a dual-energy system (77%), but weaker among those using mainly wood (57.1% would listen). Among those using natural gas, the pattern is rather one of trying to persuade others (54.1%).

People claim to be more inclined to receive the advice of their friends (56.8%) than to give their own. However, this behaviour varies with the main energy source employed. It may be noted that this is mainly the case for those using oil (60.6% receive advice) or a dual-energy system (50%), while the reverse is the case for those using mainly wood (77.8% give advice) or natural gas (69.1%).

Those who claim to be valued by their friends, neighbors or relatives as a source of information and advice on energy are less numerous (35.3%). However, this again appears to vary with the main source of energy employed. In fact, this belief is held primarily by those who use mainly oil (68.4%), while the opposite is true of those using wood (63.6%) or natural gas (54.4%).

Media consultations on energy matters do not appear to be related to the main energy source employed.

On the whole, there is a greater proportion of individuals (52.2%) claiming to be consulted on energy less often than their friends, than those claiming to be consulted more often. However, this situation differs with the energy source employed. In fact, the opposite is true of those who use mainly wood or natural gas: they generally claim to be consulted more often than their friends.

These observations, which will be confirmed by the study of natural gas users, indicate that users of natural gas are presently the opinionmakers, and this could mean that we now find ourselves at the beginning of the innovation diffusion curve, which should lead to an acceleration of conversions if communications by gas users are positive.

PRESENT USERS OF NATURAL GAS: INNOVATORS AND OPINIONMAKERS

In this section, a detailed analysis specific to users of natural gas is carried out in order to better determine their characteristics and especially their assessment of the residential energy source to which they have just converted. We will also be analyzing their communication behaviour patterns in greater detail.

Description of users of natural gas (Table 12)

Users of natural gas generally live in dwelling units exceeding 1,500 sq. ft. (77.8%) and generally consisting of six to eight rooms (53.3%). They are mainly between 35 and 54 years of age (47.3%) and most have a university education (53.4%). They are mainly professionals (21.4%) and administrators (18.6%). Most have fewer than three children (76.2%) and those without children make up the largest category (29.9%). Family income levels are quite disparate, although a stronger concentration can be seen in the over-$40 000 income categories (40.3%).

Heating systems of natural gas users (Table 13)

Among users of natural gas, a fairly large proportion (32.9%) uses supplementary heating, consisting mainly of electric heaters. The main heating systems used are hot water (52.7%), followed by forced air (28.4%). Most users (52.6%) believe their dwelling is partially insulated. Energy decisions as a rule are made jointly (54.4%) in the case of users of natural gas.

How energy sources are perceived by users of natural gas (Table 14)

Most natural gas perceive electricity as having the advantage of being clean (54.7%) and reliable (32.0%). The main disadvantage perceived is the excessive cost (46.7%). The main advantages of natural gas as perceived by its users are its economy (65.3%) and cleanliness (54.7%). The only disadvantage perceived, the safety aspect, was raised by only 14.7% of users. The perceived advantages of dual-energy systems are economy, reliability and even heat. At the same time, these were mentioned by only 9.3% and 10.9% respectively of users of natural gas. Similarly, the only disadvantage is the high cost, but this was noted by only 13.3% of users of natural gas.

Table 12

Description of Users of Natural Gas

Characteristic	Percent
Language	
English	13.9
French	86.1
Ownership	
Owners	78.5
Tenants	21.5
Dwelling floor area	
Less than 1500 sq. ft.	22.2
More than 1500 sq. ft.	77.8
Number of rooms	
5 or less	18.2
6	20.8
7	19.5
8	13.0
9 or more	19.5
Respondent's age	
18 - 24	5.3
25 - 34	18.7
35 - 44	32.0
45 - 54	17.3
55 - 64	17.3
65 or over	9.3
Marital status	
Married	76.7
Single	13.7
Other	9.6
Sex	
Male	64.0
Female	36.0

Table 12 (cont.)

Characteristic	Percent
Education level	
Elementary	6.8
Secondary	31.5
CEGEP	8.2
University	53.4
Occupation	
Professional	21.4
Sales representative	4.3
Civil servant	2.9
Administrator	18.6
Worker	8.1
Retired	12.9
Housewife	11.4
Technician	5.7
Nurse	1.4
Merchant	5.7
Student	5.1
Other	2.5
Number of children at home	
None	29.9
One	19.4
Two	28.4
Three	14.9
Four or more	6.0
Total family income before taxes	
Less than $10,000	11.9
$10,000 to $20,000	19.4
$20,000 to $30,000	11.9
$30,000 to $40,000	16.4
$40,000 to $50,000	11.9
Over $50,000	28.4

Table 13

Heating by Users of Natural Gas

Use of auxiliary heating	32.9
Electric heater	27.8
Wood	10.1
Decisionmaker in the energy field	
Man	36.7
Woman	8.9
Man and woman	54.4
Heating system	
Hot water	52.7
Forced air	28.4
Don't know	14.9
Other combinations	4.2
Dwelling insulation	
Full	34.6
Partial	52.6
None	5.1
Don't know	7.7

Table 14

How Energy Sources Are Perceived by Users of Natural Gas

Advantages	Responses	%	Disadvantages	Responses	%
Electricity:					
Clean	41	54.7	Expensive	35	46.7
Reliable, even heat	24	32.0	Dryness	14	18.7
Quiet	11	14.7			
Economical	9	12.0			
Security of supply	9	12.0			
Natural Gas:					
Clean	41	54.7	Unsafe	11	14.7
Economical	49	65.3			
Reliable, even heat	23	30.7			
Security of supply	18	24.0			
Dual Energy:					
Economical	7	9.3	Expensive	10	13.3
Reliable, even heat	8	10.9			
Oil:					
Reliable, even heat	8	10.7	Odour	43	57.3
			Expensive	43	37.3
			Bulky	14	18.7
			Supply problems	21	28.0
Wood:					
Clean	13	17.3	Odour	21	28.0
Economical	11	14.7	Unsafe	9	12.0
Reliable, even heat	11	14.7	Expensive	10	13.3
			Supply problems	15	20.0

The only advantage perceived for oil is the reliability/even heat aspect, but this was raised by only 10.7% of natural gas users. On the other hand, several disadvantages were cited, particularly odour (57.3%) and high cost (37.3%).

Relatively few individuals cited either advantages or disadvantages of heating with wood. Nevertheless, the f9llowing were mentioned: odour (28%), supply problems (20.0%), high cost (13.3%) and lack of safety (12.0%). Perceived advantages are cleanliness (17.3% mentioned it), economy (14.7%), and reliability and even heat (14.7%).

Users' knowledge on natural gas (Table 15)

The majority of users of natural gas (79.5%) claim to know the subject very well. They also claim to be fairly well (41.1%) or very well (28.8%) informed. They obtain this information mainly from friends or relatives (38.0%), brochures (32.9%), newspapers (25.3%), television (21.5%) or sales agents (20.3%). The majority (91.8%) know others who use natural gas and they are mainly very satisfied (46.6%) or satisfied (35.6%) with it. The main reason is the savings achieved.

Conversion to natural gas (Table 16)

There are nearly as many individuals who installed natural gas furnaces in their homes themselves (48.3%), as those who purchased homes with natural gas already installed (46.7%). The main reason for converting to natural gas is the saving in heating costs, and the decision proved worthwhile for all those who made it. The majority confirms it was well informed (59.3%) prior to deciding to convert. Furthermore, the conversion was carried out uneventfully in 67.3% of the cases.

The total amount spent on conversion was generally more than $700 (46.2%). Availability of subsidies was an incentive in 39.1% of the cases. Most users of natural gas (52.4%) estimate the annual savings achieved to be less than $300.00.

User perspective on natural gas in the home (Table 17)

Very few people (7.6%) have encountered problems when they use natural gas. When they do occur, they relate mainly to odours or problems caused by poor installation of the system. Most users (55.8%) are satisfied with their natural gas system. The main reasons for this are cleanliness, cost-effectiveness and reliability. Most owners (67.1%) also use natural gas for purposes other than heating, most often for hot water (57%).

Table 15

Users' Knowledge on Natural Gas

Characteristic	Per cent
Knowledge of natural gas	
Very good	79.5
Degree of information	
Well informed	28.8
Fairly well informed	41.1
Poorly informed	17.8
Can't say	12.3
Information channels	
Information booth	7.6
Friends and relatives	38.0
Representative	20.3
Brochure	32.9
Television	21.5
Radio	11.4
Newspapers	25.3
Billboard	6.3
Magazines	15.2
Other user	6.3
Workplace	6.3
Acquaintance with others using gas who are:	91.8
Very satisfied	46.6
Satisfied	35.6
Somewhat satisfied	8.2
Don't know	9.6
The reasons are:	
Cost-effectiveness	26
Reliability, even heat	13
Cleanliness	16

Table 16

Conversion to natural Gas

Characteristic	Per cent
Progress	
Installed natural gas	48.3
Built house with natural gas	5.0
Bought house with natural gas system	46.7
Reasons	
Reliability	7
Cost-effectiveness	27
Cleanliness	8
Previous system too old	11
Good subsidy	6
For all respondents installing gas, the decision proved worthwhile.	
Degree of information before deciding to convert	
Well informed	59.3
Poorly infomed	3.7
Somewhat informed	11.1
Have not selected	25.9
Progress of the conversion	
Very good	41.4
Good	25.9
Fairly good	6.9
Poorly	1.7
Not applicable	24.1
Total spent on the conversion	
Less than $200	2.4
$201 to $500	2.4
$501 to $700	7.3
$701 to $900	12.3
$901 to $1,500	14.6
More than $1,500	19.3

Table 16 (cont.)

Characteristic	Per cent
The subsidies were an incentive to conversion	
Not at all	15.2
To some degree	17.4
Substantially	39.1
Not applicable	28.3
Estimated annual savings	
Less than $100	16.7
$100 to $200	19.0
$201 to $300	16.7
$301 to $400	9.5
$401 to $500	7.2
$501 to $700	9.5
$701 to $800	4.8
More than $800	4.8
Don't know	11.9

Table 17

User Perspective on Natural Gas in the Home

	Per cent
Assessment of natural gas	
Negative	1.3
Generally negative	2.6
Fair	5.2
Generally positive	29.9
Positive	55.8
Don't know	5.2
Reasons	
Reliability	23
Cost-effectiveness	24
Cleanliness	26
Assured supply	16
Use of gas	
67.1% use gas for purposes other than heating, such as:	
Kitchen appliances	24.1
Hot water	57.1
Dryer	3.8
Problems	
Poor installation	2.5
Odours	2.5
Poor service	1.3
Billing	1.3

User perspective on natural gas in general (Table 18)

The way in which present users of natural gas perceive natural gas as a household energy source is important, as this forms the content of interpersonal communication (word-of-mouth) by users to those who are in the process of selecting, who are looking for information on natural gas, and for whom users are a credible source of information as it is based on experience.

For these users, natural gas represents a net benefit (77%); its use saves on heating costs (69.6%), even substantially (47.9%); it meets their needs (76.5%), is clean (78.2%), and finally, is a very good source of energy (83.7%). Furthermore, they believe that reserves are plentiful (83.6%), that it is a modern heating system (66.2%), and that it uses advanced technology (33.3%). Gas has many uses (75.4%), gives constant heat (82.6%) and great comfort (69.9%). It is also recommended by experts (61.8%).

They do not consider it to be a complex product (only 19.7%), and even fewer believe that gas heating equipment is complicated (only 6.6%). Their gas system installation did not seem expensive to them (11.8%). They did not perceive conversion to natural gas to be a radical change (24.1%) and they have few complaints about the odour of the gas (13.6%. Nor are they concerned about distribution interruptions (only 10.9% are concerned).

Only 14.9% consider gas to be dangerous, although 51.4% continue to believe that gas is explosive and probably take special precautions. Very few (28.5%) fear major price increases in the future. With respect to subsidies, 42.5% believe their conversion has been heavily subsidized.

It can be observed that gas users perceive this energy source much more favourably than other respondents do.

Importance of criteria for selecting an energy source (Table 19)

It may be noted that, in general, gas users assign greater importance to these criteria and are therefore more demanding energy users. Even safety is somewhat more important to them.

For users who have indicated that they consider gas to be explosive and to present some danger, it must be assumed that they have found a way to rationalize this fear of gas. It would be of interest to determine the basis of this reasoning in order to be able to use it to persuade other individuals.

Table 18

Perspective on Natural Gas in General

Gas represents a net benefit		**Gas is a complex product**	
Do not agree at all	2.7	Do not agree at all	29.6
Disagree	2.7	Disagree	19.7
Agree somewhat	14.9	Agree somewhat	28.2
Agree	52.7	Agree	14.1
Strongly agree	24.3	Strongly agree	5.6
Don't know	2.7	Don't know	2.8
Gas is dangerous		**The price of gas will increase considerably**	
Do not agree at all	31.1	Do not agree at all	11.1
Disagree	25.7	Disagree	22.2
Agree somewhat	25.7	Agree somewhat	34.9
Agree	10.8	Agree	19.0
Strongly agree	4.1	Strongly agree	9.5
Don't know	2.7	Don't know	3.2
Gas heating equipment is complicated		**Installation of a gas system is expensive**	
Do not agree at all	49.3	Do not agree at all	19.1
Disagree	25.3	Disagree	35.3
Agree somewhat	16.0	Agree somewhat	30.9
Agree	5.3	Agree	11.8
Strongly agree	1.3	Strongly agree	
Don't know	2.7	Don't know	2.9
Gas is explosive		**Conversion to gas is a radical change**	
Do not agree at all	12.5	Do not agree at all	29.2
Disagree	13.9	Disagree	13.8
Agree somewhat	19.4	Agree somewhat	30.8
AGree	33.3	Agree	15.4
Strongly agree	18.1	Strongly agree	7.7
Don't know	2.8	Don't know	3.1

Table 18 (cont.)

Use of gas saves on heating		**Gas meets consumers' needs**	
Do not agree at all	0.0	Do not agree at all	0.0
Disagree	4.3	Disagree	1.5
Agree somewhat	23.2	Agree somewhat	19.1
Agree	49.3	Agree	55.9
Strongly agree	20.3	Strongly agree	20.6
Don't know	2.9	Don't know	2.9
Gas is clean		**Gas gives off an unhealthy odour**	
Do not agree at all	1.4	Do not agree at all	43.8
Disagree	4.2	Disagree	27.4
Agree somewhat	12.5	Agree somewhat	12.3
Agree	41.7	Agree	6.8
Strongly agree	37.5	Strongly agree	6.8
Don't know	2.8	Don't know	2.7
Heating with gas permits substantial savings		**Conversion to gas is heavily subsidized**	
Do not agree at all	2.8	Do not agree at all	7.6
Disagree	9.9	Disagree	9.1
Agree somewhat	36.6	Agree somewhat	37.9
Agree	35.2	Agree	27.3
Strongly agree	12.7	Strongly agree	15.2
Don't know	2.8	Don't know	3.0
Gas is a very good energy source		**Gas can be subject to interruptions in distribution**	
Do not agree at all	2.7	Do not agree at all	45.2
Disagree	1.4	Disagree	32.9
Agree somewhat	9.5	Agree somewhat	8.2
Agree	45.9	Agree	6.8
Strongly agree	37.8	Strongly agree	4.1
Don't know	2.7	Don't know	2.7

Table 18 (cont.)

Gas resources are plentiful		The gas system is modern	
Do not agree at all	0.0	Do not agree at all	1.4
Disagree	0.0	Disagree	8.1
Agree somewhat	13.7	Agree somewhat	21.6
Agree	46.6	Agree	40.5
Strongly agree	37.0	Strongly agree	25.7
Don't know	2.7	Don't know	2.7
Gas uses advances technology		**Gas has many uses**	
Do not agree at all	1.4	Do not agree at all	0.0
Disagree	21.7	Disagree	4.3
Agree somewhat	40.6	Agree somewhat	17.4
Agree	23.2	Agree	55.1
Strongly agree	10.1	Strongly agree	20.3
Don't know	2.9	Don't know	2.9
Gas provides constant heat		**Gas is recommended by experts**	
Do not agree at all	1.3	Do not agree at all	1.5
Disagree	2.7	Disagree	1.5
Agree somewhat	10.7	Agree somewhat	32.4
Agree	53.3	Agree	41.2
Strongly agree	29.3	Strongly agree	20.6
Don't know	2.7	Don't know	2.9
Gas provides great comfort			
Do not agree at all	1.4		
Disagree	5.5		
Agree somewhat	20.5		
Agree	45.2		
Strongly agree	24.7		
Don't know	2.7		

Fears about gas among those using gas

	Responses
Unsafe	12

Table 19

Relative Importance of Criteria Employed by Users of Natural Gas to Select an Energy Source

Criteria	Per cent
Comfort	
Little importance	1.4
Some importance	4.3
Important	21.4
Very important	72.9
Odour	
Very little importance	4.4
Some importance	7.4
Important	23.5
Very important	64.7
Safety	
Some importance	2.9
Important	10.1
Very important	87.0
Cleanliness	
Very little importance	1.4
Some importance	2.8
Important	29.6
Very important	66.2
Availability	
Some importance	2.9
Important	17.4
Very important	79.7
Cost of installation	
Little importance	1.5
Some importance	13.6
Important	33.3
Very important	51.5
Cost of heating	
Little importance	1.5
Some importance	3.0
Important	14.9
Very important	80.6
Modern equipment	
Little importance	4.5
Some importance	17.9
Important	34.3
Very important	43.3

Communication (Table 20)

Conversions already effected in the field of gas could be of particular interest, especially if we consider the high level of overall satisfaction among those who have selected natural gas as an energy source. If these people were communicators and opinionmakers they could transmit their beliefs and experience to those who were hesitant.

The communication patterns of natural gas users were assessed in this survey (Table 20). Users of gas are generally very interested in the energy field (56%) and enjoy talking about it (54.5%). They also consider themselves to be knowledgeable about energy (36.8%) and supply an average (46.1%) or large (9.2%) amount of information to others. They are generally consulted as much as (42.7%) or more than (18.7%) others on energy issues. During energy discussions, they generally prefer to persuade (51.4%), and they advise others (66.7%) rather than seek advice. They are considered good sources of information and advice on energy (53.1%).

Compared to the target population as a whole, it will be noted that, in addition to being innovators who have decided earlier than others to convert to natural gas, users have certain traits characteristic of opinionmakers in terms of their behaviour as sources of information and advice. This observation should be an indication that positive word-of-mouth communication should stimulate and encourage the diffusion of natural gas.

Table 20

Communication About Natural Gas by Users

	Per cent
Interest in the energy field	
None	5.3
A little	12.0
Some	26.7
Fair	33.3
A great deal	22.7
Enjoys talking about energy	54.5
Considers self knowledgeable about energy	
Not at all	7.9
A little	22.4
Somewhat	32.9
Fairly	28.9
Very	7.9
Supplies information to others	
Very little	44.7
An average amount	46.1
A great deal	9.2
Consulted on energy questions	
Less than others	38.7
As much as others	42.7
More than others	9.2
Generally, during discussions on energy, prefers	
To listen	48.6
To persuade	51.4
Advice on energy	
Advises others	66.7
Advised by others	33.3

Table 20 (cont.)

	Percent
Generally perceived as a good source of information and advice on energy	53.1
Source of energy information	
Newspapers	62.0
Magazines	36.7
Television	57.0
Radio	35.4
Friends and relatives	22.8
Associations	12.7
Source credibility	
Gas distributor	16.5
Federal government	24.1
Provincial government	13.9
Ministry of Energy and Resources	45.6
Consumer Protection Bureau	63.3
Reading on the subject	5.1
Communication among users on their experience with natural gas	
Not at all	15.2
A little	54.4
A great deal	19.0
Did not answer	11.4

INTERPRETATIONS, CONCLUSIONS AND RECOMMENDATIONS

The results indicate that the overall competitive position of natural gas is not disastrous. Competition from electricity is not as keen as it might have seemed at first. In fact, gas is perceived to have many benefits, including a slight economic benefit. On the other hand, it is obvious that the resistance created by considerations of safety and the negative image held by gas in this area cannot be ignored and should be dealt with at once in order to find a solution.

Some market penetration is taking place -- information requests and decisions to convert, as well as actual conversions -- at a rate which might be considered slow by some officers of gas distribution and household conversion firms. However, progress is being achieved in Montreal, Trois-Rivières, Quebec City and Sherbrooke, all of which are at various stages in the marketing of natural gas: Montreal, where it has been available for several years, Trois-Rivières, which has just been connected, and Quebec City and Sherbrooke, which are about to be connected.

Also noteworthy is the very high overall level of satisfaction of gas users, both from their own statements and the testimony of respondents who know people who have converted to natural gas. Users in general have a more favourable opinion of natural gas than non-users.

This observation, together with the fact that knowledge on natural gas is very limited in the region, suggests the idea, confirmed by research in other fields, that an increase in the level of knowledge and understanding of natural gas would further improve its image in the target areas and help to overcome the negative effect of fear.

There is clear evidence of the role which natural gas users play as communicators and opinionmakers. This indicates that satisfied users, who are in the majority and for the most part engaged in interpersonal communications favourable to natural gas, comprise an element which should accelerate the diffusion and adoption of natural gas as a source of energy for the home.

The research results appearing in this report have provided us with a more accurate and objective view of the state of natural gas marketing in the Quebec residential market within the areas of potential conversion. The following major conclusions derive from the data and information brought out and summarized in this report:

° The penetration of natural gas as an energy source in the Quebec market is well underway.

° It is evident, on the basis of the various behaviour patterns, intentions and perceptions in Montreal, Trois-Rivières, Quebec City and Sherbrooke, that a diffusion process is well underway.

° Natural gas is perceived as having obvious benefits, but it suffers from a severe handicap: people perceive it as being unsafe.

° On the other hand, the degree to which natural gas is known and understood remains very limited, which is undoubtedly a significant factor in the slowdown in conversions.

° It has been observed that natural gas users are highly satisfied and have a positive attitude toward natural gas to a greater extent than the rest of the population.

° Furthermore, users of natural gas have the communication behaviour characteristics of opinionmakers and thus, in the Quebec context, are active sources of positive information on gas.

° Finally, the information sources on natural gas perceived as credible by the target population consist mainly of organizations whose role is to protect the consumer, or of ministries responsible for energy and resources.

The following recommendations arise from the results and conclusions of this study. Their intent is to accelerate the diffusion of natural gas in the Province of Quebec.

° The amount of information aimed at the target population on both natural gas and the subsidies should be increased.

° This information campaign should be supported by personal endorsements in order to activate the extremely positive interpersonal communication behaviour patterns already in existence.

° The organizations which should undertake this communication campaign are the ministries responsible for consumer protection or for energy and resources (since this study indicates they would have the highest credibility in this field).

- The problem will not be solved by increasing subsidies, but rather by communicating concrete and objective information on gas as a source of home heat.

- An additional research effort should be undertaken to find ways of resolving the fear problem and initiating discussion of this issue as effectively as possible.

- An analysis of marketing methods and problems could also be carried out to determine other assistance options at this level, possibly through the provision of training.

- Finally, greater efforts should be made to monitor the diffusion of natural gas and understand its market variations.

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